

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT

**NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

(PCT Rule 71.1)

Date of mailing (day/month/year)	31.05.2001
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Applicant's or agent's file reference 293	<b>IMPORTANT NOTIFICATION</b>	
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International application No. PCT/GB00/00556	International filing date (day/month/year) 17/02/2000	Priority date (day/month/year) 17/02/1999
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Applicant KINGS COLLEGE LONDON et al.
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1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

#### 4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 293	<b>FOR FURTHER ACTION</b>	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/GB00/00556	International filing date (day/month/year) 17/02/2000	Priority date (day/month/year) 17/02/1999
International Patent Classification (IPC) or national classification and IPC H04B1/707		
Applicant KINGS COLLEGE LONDON et al.		
<p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 7 sheets, including this cover sheet.</p> <p><input type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of sheets.</p>		
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li>I    <input checked="" type="checkbox"/> Basis of the report</li> <li>II    <input type="checkbox"/> Priority</li> <li>III    <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li>IV    <input type="checkbox"/> Lack of unity of invention</li> <li>V    <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li>VI    <input type="checkbox"/> Certain documents cited</li> <li>VII    <input checked="" type="checkbox"/> Certain defects in the international application</li> <li>VIII    <input checked="" type="checkbox"/> Certain observations on the international application</li> </ul>		
Date of submission of the demand 15/09/2000	Date of completion of this report 31.05.2001	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Bauer, F Telephone No. +49 89 2399 2737	



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**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):  
**Description, pages:**

1-8                   as originally filed

**Claims, No.:**

1-8                   as originally filed

**Drawings, sheets:**

1/5-5/5               as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description,       pages:
- the claims,           Nos.:

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the drawings,      sheets:

5.  This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):  
*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims 1-8
	No:	Claims
Inventive step (IS)	Yes:	Claims
	No:	Claims 1-8
Industrial applicability (IA)	Yes:	Claims 1-8
	No:	Claims

**2. Citations and explanations  
see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:  
see separate sheet

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:  
see separate sheet

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**Re Item V**

1. Reference is made to the following documents:

D1: OJANPERA T ET AL: 'Qualitative comparison of some multiuser detector algorithms for wideband CDMA' IEEE VEHICULAR TECHNOLOGY CONFERENCE, XX, XX, vol. 1, 1998, pages 46-50-50vol1

D2: KOULAKIOTIS D ET AL: 'EVALUATION OF A DS/CDMA MULTIUSER RECEIVER EMPLOYING A HYBRID FORM OF INTERFERENCE CANCELLATION IN RAYLEIGH-FADING CHANNELS' IEEE COMMUNICATIONS LETTERS, US, IEEE SERVICE CENTER, PISCATAWAY, US, vol. 2, no. 3, 1 March 1998 (1998-03-01), pages 61-63, ISSN: 1089-7798 cited in the application

2. All claims have been, as far as possible, interpreted using the description (see Item VIII).

3. a) D2 discloses, as already acknowledged on page 3 of the description of the present application, a method for reducing interference between users of a carrier signal in which all users have the same bit rate (the same processing gain of 36 is used for all users) and have their interference reduced by HIC.

b) The difference between this disclosure and the subject-matter of claim 1 is that the later applies to systems with users having a higher and users having a lower bit-rate and discloses to apply HIC first to the high bit-rate users and then to the lower bit-rate users.

c) Thus, beginning from D2, the problem solved by the claimed invention could be seen in adapting it to a multi-rate system.

d) The skilled man would then have a look at documents concerned with interference cancellation in multi rate systems. D1 is such a document. It explains that, in variable spreading factor schemes (i.e. multi rate) the processing gain is varied according to the data rate. Therefore, the power of a high bit rate user is higher than the power of a low bit rate user. (D1, page 46, second column, lines

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14-20). Moreover, D1 proposes, in order to solve those problems (page 49, right column, line 45 - page 50, left column), to apply two cancellation stages, and "to weight or not to consider at all the low bit rate users in the first stage" (page 50, left column). In the second stage, the low bit-rate users are considered.

The skilled man, applying this teaching to the HIC technique known from D2, would first apply HIC to the high bit rate users and then apply HIC to the low bit rate users, thus arriving to the subject-matter claimed in claim 2.

e) Therefore, the subject-matter of **claim 1** of the present application cannot be considered as involving an inventive step (Article 33(3) PCT).

4. The subject-matter of **claims 2-8** of the present application cannot be considered as involving an inventive step for the following reasons (Article 33(3) PCT).

**Claims 2 and 6-8:** Claims 3-7 consist merely in the juxtaposition or association of known (e.g. from D1 or D2) devices or characteristics functioning in their normal way and not producing any non-obvious working inter-relationship.

**Claims 3 and 4:** The only two obvious possibilities are to cancel the signal at the baseband or to cancel the modulated signal, i.e. at the matched filter output.

**Claim 5:** This claim attempts to define the subject-matter in terms of the result to be achieved, without mentioning any technical feature.

**Re Item VII**

1. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.
3. The claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (document D2) being placed in a preamble (Rule 6.3(b)(i))

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PCT) and with the remaining features being included in a characterising part (Rule 6.3(b)(ii) PCT).

**Re Item VIII**

1. The meaning of "between" in **claim 1**, page 9, line 6 is not clear (Art. 6 PCT). It is not clear whether it is meant that then the interference of the other lower bit rate users is reduced.
2. In **claim 2**, it should have been written what PIC stands for. It should as well have been clarified, according to the description (page 4, lines 1-2), what is meant by "the most reliable users". Last, it should have been written that the signals corresponding to the most reliable users, and not the users themselves are selected.
3. In **claims 3 and 4**, all the definite articles "the" are applied to terms that were not defined in any of the previous claims. Un indefinite article should therefore have been employed, and the terms "regenerated signals", "cancelled", "received signals", "remaining users" and "cross correlations" should have been defined and clarified in the claims.
4. **Claim 5** does not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claim attempts to define the subject-matter in terms of the result to be achieved (a substantially complete cancellation) which merely amounts to a statement of the underlying problem. The technical features necessary for achieving this result should have been added.
5. In **claim 6**, the expression "complex HIC" should have been clarified, as it does not seem to be a wide-used method.
6. In **claim 7**, the difference between "HIC with the best BER" and "HIC" should have been clarified, because this is the only characterising feature of this claim.

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7. In claim 8, the expression "H-H-1" and "L-P-S" should have been clarified, as they do not seem to be wide-used expressions. Moreover, they represent the only characterising feature of this claim.